EXP-19
July 17, 1972

ACCELERATOR EXPERIMENT--Vertical Misalignment of Bending Magnets

Experimentalists: Main Ring Staff, E. Bleser in particular

Date Performed: The week of June 26-July 3, 1972

Experimental Observations:

1. During the 5-day shutdown at the end of June 1972 all the main ring magnets (quadrupoles and dipoles) had their vertical positions surveyed. As stated in a previous report (EXP-14), several magnets were misaligned by as much as 0.2 inches, causing, therefore, an effective limitation of the vertical aperture. During the same shutdown several dipoles were moved vertically. After the operation all the magnets were misaligned by no more than 0.1 inches. The actual displacements of every magnet are displayed in Figs. 1 and 2, sector by sector, excluding those with the absolute value less than 50 mils. Interesting is the confrontation of these data with the old surveyed data (Oct. 1971) shown in EXP-14. The two sets of data seem to us to be consistent.

2. Before the magnet move, typically, 3 mA of beam at the top of the cycle were observed for every 10 mA injected. After the magnets were moved, typically, 5 mA of beam at the top of the cycle were observed for every 10 mA injected. This might be correlated to the fact that before the shutdown the vertical aperture of the

ring was only 3.0 π mm mrad, and that the actual value of the aperture, after the magnets were moved, is 4.2 π mm mrad.

Suggestions:

1. In order to regain the full aperture of 4.75 π mm mrad the ring can provide, we listed in Table I the magnets, with their actual aperture, that we need to realign. All the other magnets, even with a large misalignment, do not cause any limitation to the total aperture.

2. Nevertheless, the magnets in the following locations have been replaced since the last shutdown:

A24-2	A37-3	B11-3	B23-3
C39-5	F13-3	F14-4	F19-5
F37-3	F43-3	F45-4	F45-5

Should we survey them again?

A. G. Ruggiero

TABLE I

Location	Displacement	Aperture
E26-3	-0.095	4.19 π mm mrad
B46-3	+0.085	4.36
B26-3	-0.080	4.41
D22-3	+0.080	4.42
F19-3	+0.080	4.42
D26-3	+0.075	4.47
E19-3	-0.075	4.47
E24-3	-0.075	4.47
E32-3	-0.075	4.47
E28-3	-0.070	4.53
D18-4	+0.095	4.57
F12-4	+0.095	4.57
F14-4	+0.095	4.57
B36-3	-0.065	4.65
D15-3	+0.065	4.65
E13-3	-0.065	4.65
F15-3	+0.065	4.65
A38-3	-0.060	4.71
C28-3	-0.060	4.71
C38-3	+0.060	4.71
D24-3	+0.060	4.71
E34-3	-0.060	4.71

Fig. 1

20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

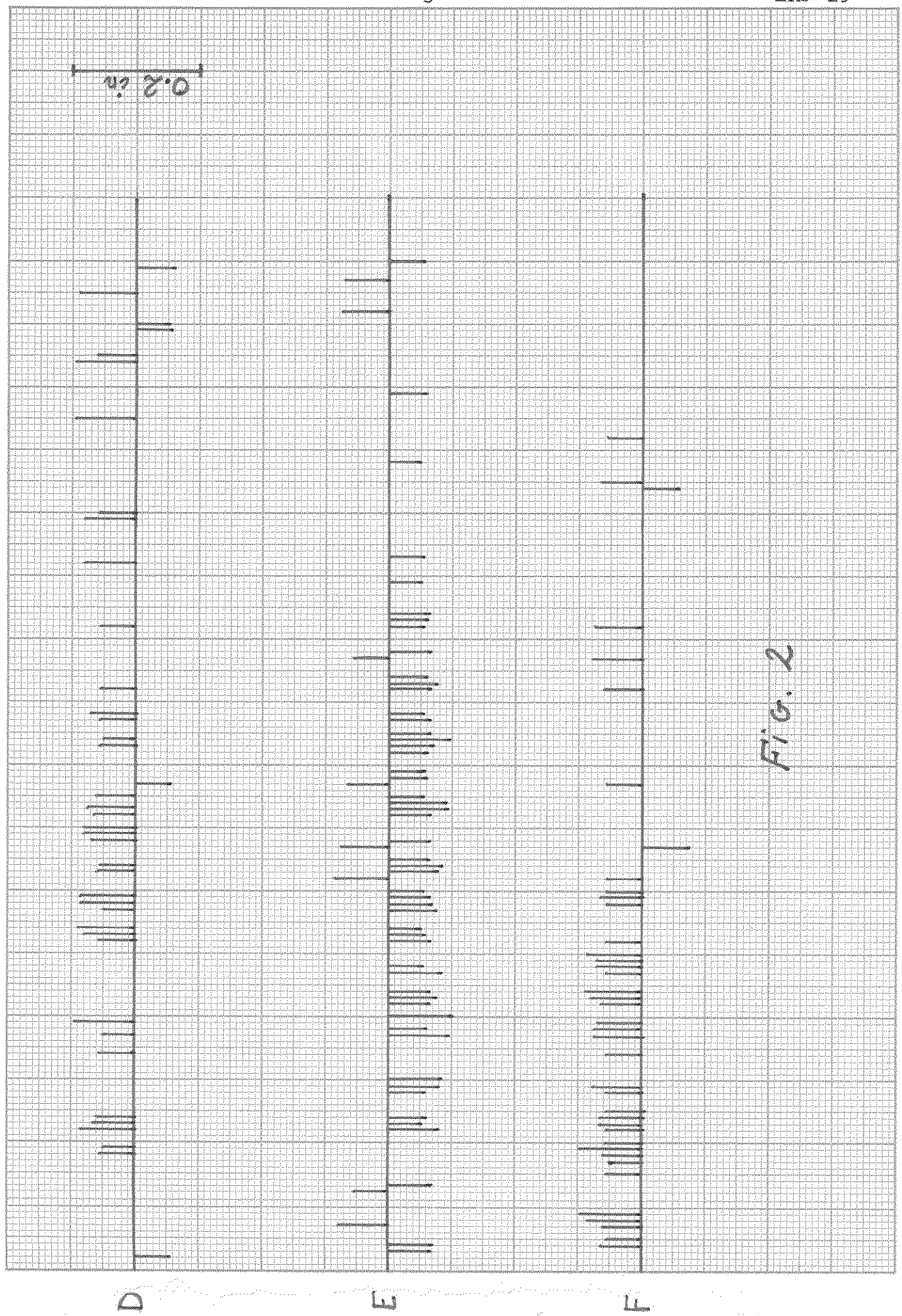

Fig. 2

20 X 20 TO THE INCH 46 1240
7 X 10 INCHES
KEUFFEL & ESSER CO.